

## ABSTRACT

A method for forming a substantially spherical free air ball on a fine non-oxidizable wire in a computerized bonder, which has a computerized flame-off (EFO) apparatus operable to generate pulses of different heights and widths. A train of EFO current pulses is applied between electrode and wire; examples are shown in FIGs. 8 and 9. The pulse heights are controlled to melt a predetermined volume of wire while minimizing the heat-affected zone of the wire as well as the wire necking, thus creating free air balls of small diameters and high ball/wire strength. The pulse widths are controlled to create a substantially spherical ball shape. The pulse train of various heights and widths is minimized in order to minimize the time needed for one bond and to maximize the number of bonds provided per second.